

THE ONTOLOGICAL STATUS OF LACAN'S MATHEMATICAL PARADIGMS



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Show that the median, hce che ech, intersecting at royde angles the
parilegs of a given obtuse one biscuits both the arcs that are in
curveachord behind.

—James Joyce, *Finnegans Wake*

Readers of Lacan's work have disagreed over what to make of his forays into the mathematical field of topology. Some, such as Jeanne Granon-Lafont, have taken quite seriously two ideas: that topology provides the only proper model for developing the insights of metapsychology, and that metapsychological insights into topological structures can be useful to mathematicians.¹ Others, such as Joël Dor, have argued that Lacan's topological models serve merely as "metaphorical illustrations" of psychoanalytic discoveries.² Dor is concerned with absolving Lacan of having indulged in a disastrous enterprise; Granon-Lafont maintains that Lacan's theses make no sense apart from the topological manner in which he articulated them. The aim of this chapter is to try to specify the precise ontological status that Lacan assigns to his topological models, focusing in particular on the Borromean knots that make their first appearance in Seminar XX.

LACAN'S APPEAL TO MATHEMATICAL FORMALIZATION

In chapter 10 of Seminar XX, Lacan writes:

Mathematical formalization is our goal, our ideal. Why? Because it alone is
matheme, in other words, it alone is capable of being integrally transmitted.

Mathematical formalization consists of what is written, but it only subsists if I employ, in presenting it, the language (*langue*) I make use of. Therein lies the objection: no formalization of language is transmissible without the use of language itself. It is in the very act of speaking [*C'est par mon dire*] that I make this formalization, this ideal metalanguage, ex-sist. (119)

Lacan's first sentence here is straightforward: the telos of psychoanalytic theory is a mathematical formalization of some sort. The justification of this claim is that "it alone is *matheme*." But what exactly is a *matheme*? Lacan gives a partial answer to this question by suggesting that *mathemes* are "capable of being integrally transmitted," or are "capable of transmitting themselves [*se transmettre*] integrally." It is useful to recall here that the Greek word *mathesis* means learning. If by "integrally transmitted" Lacan means something like "passed on from teacher to student," then a *matheme* would be that which a teacher gives a student, or that discourse in which learning can be passed on.

But Lacan immediately goes on to suggest that, by themselves, *mathemes* cannot transmit anything, since "no formalization of language is transmissible without the use of language itself." To formalize a language would be to translate its terms into a set of fixed symbols and to specify a finite number of axioms that would govern the production of sentences in that language. Such a formalized language would itself be a *matheme*—that is, a discourse that could serve as the repository of a *mathesis universalis*. Leibniz presented perhaps the purest ideal of such a discourse in his conception of a "universal characteristic," into which all languages could be translated. In the future, Leibniz hypothesized, people would settle all disputes by saying, "Let us calculate."

I take it that by "metalanguage" Lacan has in mind something very close to Leibniz's universal characteristic. To say that there is no such thing as a metalanguage is to say that the task of constructing such a universal discourse could never be completed. At a minimum, Lacan suggests, it would always be necessary to motivate the metalanguage through some other discourse. Thus the attempt to translate everything into a formal discourse is subject to either of two possible failures: on the one hand, the translation is completed, with the result that the symbols become hermetically inscrutable; on the other hand, one retains a discourse that can motivate the symbols, in which case the translation is never completed.³ Take *Finnegans Wake*. Unlike, say, *Principia Mathematica*, Joyce's text seeks not univocity but plurivocity, and rather than constituting a pure symbolic language that would be distinct from natural languages, it aspires to the condition of being written in all languages simultaneously.⁴ In this sense, *Finnegans Wake* might seem to be the very opposite of a formalized text, but if we take Lacan's point seriously, the relationship between *Finnegans Wake* and *Principia Mathematica* can be read in terms of the logic of the Möbius strip. Insofar as it is written in English, *Principia Mathematica* is itself not written in the formalized language it defines. Suppose Russell and Whitehead had tried to go one step further by writing the whole thing in the formalized language itself. The result would have been an inscrutable text that we could not read at all—

unless perhaps the authors had adopted the strategy of using English words in necessarily unfamiliar ways. The “English” words of *Principia Mathematica* would then be mere homonyms with English words, so that reading the text would give one the uncanny feeling that one was understanding something that made no sense at all—exactly the feeling we get reading *Finnegans Wake*. Or, to turn the point around, in writing *Finnegans Wake*, Joyce deliberately made his text inscrutable—but not so inscrutable that it was altogether impossible to read, whence, the proliferation of scholarly guides to the book that indicate where one might identify the various linguistic roots of all of the portmanteau words. When I pick up a book such as *A Guide to the Use of Finnish in Finnegans Wake*, I get something like *Principia Mathematica* in Finnish: a text that shows me how to interpret Joyce’s highly “formalized” language. So it is as if the effort to subject *Finnegans Wake* to a rigorous reading turns Joyce’s text into something resembling *Principia Mathematica*, just as the effort to write a completely rigorous *Principia Mathematica* would have turned that text into *Finnegans Wake*. Given Lacan’s view that psychoanalytic theory aspires to the condition of a formalized language, it is no wonder that he was drawn to Joyce’s text. The moral of this story is that if psychoanalysis aspires to the condition of mathematical formalization, we should not expect to be able to say whether the results will more closely resemble mathematics or poetry.

One type of complaint against Lacan’s thesis as I have formulated it so far would be a Derridean sort of objection. Lacan says that a matheme must be written; it has the form of an *écrit*, but it only “subsists” as matheme through a motivating discourse that has the character of spoken language (“*mon dire*”). Hence, the Derridean argues that Lacan is here repeating the classical philosophical gesture par excellence by treating writing as “dead” language and speech as “living” language. The only warrant for such a distinction would seem to be a clandestine metaphysics that grants what Lacan is officially supposed to deny, namely, subjectivity’s self-presence to itself. In other words, Lacan seems to repeat his earlier distinction between full and empty speech, a distinction that comes under attack in Jean-Luc Nancy’s and Philippe Lacoue-Labarthe’s *The Title of the Letter*, a book that Lacan mentions several times in Seminar XX.⁵

Leaving aside the hermeneutic question of the relationship between Seminar XX and Lacan’s Rome discourse (in which the distinction between full and empty speech is taken up), there are a number of reasons Lacan’s account of the relationship between written mathemes and spoken discourse need not succumb to the Derridean objection. In claiming that mathemes are incapable of functioning without a motivating discourse, Lacan can be read as making a point about the relationship between an “object language” and a “metalan-guage,” as these terms usually are understood in mathematical logic. When an attempt is made to “formalize” a language, as in *Principia Mathematica*, the language that is to be formalized often is called the “object language,” while the language in which we describe the object language is what is called the

“metalanguage.”⁶ So in *Principia Mathematica*, we would say that everyday English is the metalanguage in question, not the formalized language that Russell and Whitehead define. One of the crucial results arising out of Tarski’s work was the suggestion that an adequate theory of truth for a formal language could be presented only if one distinguished between the object language *for* which we define a truth predicate and the metalanguage *in* which we define this predicate.⁷

When Lacan says that no formalization of language is possible without a motivating discourse, he seems to be invoking this result, so his use of “metalanguage” would be the inverse of what we would expect.⁸ If so, and provided we take into account the idiosyncrasies of his terminology, there is no reason the motivating language needs to be a spoken discourse. The point that Lacan is making is not to oppose the written to the spoken but to oppose that which is written in a formal language to that “other language” in terms of which the formal language can be presented as such. Admittedly, Lacan does say that a formal language must be written, for reasons I will come back to, but this in itself says nothing about how we are to conceive of the relationship between speech and writing. Moreover, there is no reason to think that the motivating discourse is “complete” in contrast to the “incompleteness” of the object language. More plausibly, we could read Lacan as making a point about what Derrida calls “supplementarity,” namely, that no formalization of a language can take place except by a supplementary language, which in turn would require a supplementary language for its own formalization.

If anything, in claiming that there is no such thing as a metalanguage, Lacan is making the eminently Derridean point that language is not the medium through which the presence of being reveals itself. More precisely, Lacan has this to say:

When I say that [there’s no such thing as a metalanguage], it apparently means—no language [*langage*] of being. But is there being? As I pointed out last time, what I say is what there isn’t. (Seminar XX, 118)

That which I say is that which is not: *ce que je dis, c’est ce qu’il n’y a pas*. If Lacan prefers to use the term *metalanguage* to refer to the ideal of a formalized language, it is in part because he associates that ideal with the dream of metaphysics. Metalanguage, as the formal discourse of metaphysics, would be the language in which being could be said. But, Lacan argues, being is precisely that which is not said in any language, whence again the impossibility of a metalanguage. Indeed, just to push the juxtaposition with Derrida a bit further, as Lacan construes the ideal of a written metalanguage, it coincides with what Derrida discerns as the philosophical ideal of living speech. Just as Derrida exposes the manner in which that ideal cannot be articulated without an appeal to writing, so Lacan is making a comparable point when he argues that the ideal of a metalanguage cannot be articulated without an appeal to the discourse that would motivate such a language.

It should be noted, of course, that the post-Fregean project of constructing a pure formalized language has not always been associated with metaphysics. Frege's *Begriffsschrift* does tie the two together, but *Principia Mathematica* and especially Carnap's *The Logical Syntax of Language* explicitly separate the function of constructing a formal language from any metaphysical pretensions. Of all twentieth-century philosophers, perhaps no one would agree more readily with Lacan than Carnap that what I say has nothing whatsoever to do with being.

But there is a difference between Carnap and Lacan. For Carnap, metaphysics is something that can be dispensed with entirely. The Gordian knot can be cut once and for all, thereby separating scientific discourse from metaphysics. Lacan, in contrast, suggests that the knot in question has a convoluted structure, and he goes so far as to suggest that the proper task for psychoanalytic theory is to investigate the gesture by which modern science claims to break from metaphysics.⁹

Lurking in the background of Lacan's discussion in Seminar XX is his important essay, "Science and Truth," presented in 1965, a year after Seminar XI.¹⁰ In Seminar XI, Lacan advances the thesis that the subject with which psychoanalysis is concerned is none other than the Cartesian cogito. In "Science and Truth," he expands on this thesis, identifying the cogito as "the subject of science." Drawing on the work of Alexandre Koyré (whom he invokes again in chapter 7 of Seminar XX), Lacan argues that the "position of the subject" undergoes a radical shift with the rise of modern science, and he identifies the Cartesian cogito as that which emerges from this shift. What I would like to call attention to here is the importance that Lacan ascribes to a certain Cartesian *scene*:

Descartes' approach is, singularly, one of safeguarding the ego from the deceitful God, and thereby safeguarding the ego's partner—going so far as to endow the latter with the exorbitant privilege of guaranteeing the eternal truths only insofar as he is their creator.¹¹

In the last part of this sentence, Lacan is referring to the fact that, according to Descartes, if God had so chosen he could have made it the case that $2 + 2 = 5$. In Seminar XI, Lacan comments on "the extraordinary consequences" of this "handing back of truth into the hands of the Other," going so far as to suggest that the Cartesian algebraization of geometry, along with all of its consequences in the subsequent history of mathematics, is somehow dependent on this gesture by which God is granted the power to make what is true be true.¹² I will return to this topic, but for now I would simply note that the Cartesian thesis here is radically opposed to that of Plato. In the *Euthyphro*, we are clearly expected to conclude, with Socrates, that the holy is not holy because the gods love it; rather, the gods love it because it is holy. For Descartes, in contrast, if God never makes a mistake balancing his checkbook, it is because whatever he tallies is correct.¹³

The passage from Seminar XI discussed above gives us reason to think that psychoanalysis might have something to say about the rise of modern mathematics and modern science, though the details of that story still need to be worked out. But it does not seem to explain why metapsychology itself might tend toward its own type of mathematical formalization. In Seminar XI, Lacan takes great pains to defend the idea that psychoanalysis is, or aspires to be, a science. In order to make that claim, he finds it necessary to distinguish between a science that takes *reality* as its object and a science that takes *the real* as its object. In Seminar XX, he claims that “Mathematization alone reaches a real . . . that has nothing to do with what traditional knowledge has served as a basis for, which is not what the latter believes it to be—namely, reality—but rather fantasy” (131). For Lacan, “reality” always refers to something framed by fantasy, while “the real” names—or gestures in the direction of—that which we never encounter *as such*. By distinguishing between these two senses of science, Lacan is able simultaneously to criticize those psychoanalysts for transforming Freud’s discourse into a science of reality and for failing to transform it into a science of the real. At the same time, I suggest, he wants to distinguish between two levels of the Cartesian discourse. By appealing to a benevolent God who guarantees the correctness of my clear and distinct perceptions of objects, Descartes conjures an “objective” reality that is always supported by an appeal to fantasy. But the advent of Cartesian science lies not there but rather at the level of the mathematical signifier whose proper destination is to yield not a science of reality but a science of the real. It is the completion of that destiny that interests Lacan.

MODERN SCIENCE AND THE LOSS OF THE SEXUAL RELATIONSHIP

In order to bring out what is at stake here, I propose an analysis of the Cartesian scene that Lacan calls to our attention.

Accordingly, I will suppose not a supremely good God, the source of truth, but rather an evil genius, supremely powerful and clever, who has directed his entire effort at deceiving me. I will regard the heavens, the air, the earth, colors, shapes, sounds, and all external things as nothing but the bedeviling hoaxes of my dreams, with which he lays snares for my credulity. I will regard myself as not having hands, or eyes, or flesh, or blood, or any senses, but as nevertheless falsely believing that I possess all these things.¹⁴

Am I so tied to a body and to the senses that I cannot exist without them? But I have persuaded myself that there is absolutely nothing in the world: no sky, no earth, no minds, no bodies. Is it then the case that I too do not exist? But doubtless I exist, if I persuaded myself of something. But there is some deceiver or other who is supremely powerful and supremely sly and who is always deliberately deceiving me. Then too there is no doubt that I exist, if he is deceiving me.¹⁵

It would be impossible for me to exist, being of such a nature as I am (namely, having in me the idea of God), unless God did in fact exist. God, I say, that same being the idea of whom is in me: a being having all those perfections that I cannot comprehend, but can somehow touch with my thought, and a being subject to no defects whatever. From these considerations it is quite obvious that he cannot be a deceiver.¹⁶

How should this scene be interpreted? One way would be to adopt the method of Lévi-Strauss.¹⁷ Instead of attempting to interpret each of the elements of the Cartesian scene, we could treat it like a myth whose significance lies in its relationship to other myths. Lévi-Strauss sees in myth the articulation of the transition from nature to culture. At issue in the Cartesian scene for Lacan is not so much the transition from nature to culture as from a dogmatic metaphysics to science. Instead of classifying such a discourse as a myth, we might better characterize it, for reasons I will elaborate on below, as a thought experiment. In the manner of Lévi-Strauss, I will call the Cartesian thought experiment not M_1 but C_1 .¹⁸

"Thought experiment" would have a double sense: on the one hand, it would name any experiment carried out *in thought*; on the other hand, it would name an experiment carried out *on* thought itself. Conceived in this double way, it is perhaps fair to say that thought experiments are to the advent of modern science precisely what myths are to the advent of culture. Galileo provides us with an exemplary instance of the former. It is *in* thought that I imagine a frictionless space where, once moved, a body will continue in its course indefinitely. The Cartesian thought experiment has this character too (i.e., it is in thought that I imagine the possible existence of an evil deceiver, etc.). It also is an experiment on thinking as well, for to carry out the experiment is precisely to isolate my thought as object of inquiry, to experiment on it, as when I ask myself, suppose I really believed in this evil deceiver—what then would be the status of my thinking?

One might be tempted to say that thought experiments predate modern science. After all, what do we get in Plato's cave analogy if not a thought experiment? But there seems to be a difference. At stake in the cave analogy is a question about the relationship between the objects of perception, or *aisthesis*, and the intelligible forms that make them what they are. It is not the reality of these objects that Plato questions but their degree of reality. In contrast, the Cartesian thought experiment breaks with *aisthesis* altogether ("I shall consider myself as having no hands, no eyes, no flesh, no blood, *nor any senses*"). The cogito that emerges from this radical break with *aisthesis* is a subject of pure *noesis* ("I am therefore precisely nothing but a thinking thing; that is, a mind, or intellect, or understanding, or reason—*words of whose meanings I was previously ignorant*").¹⁹ Koyré offers a similar reading of Galileo. Calling attention to the radicality of the Galilean break with premodern science, he writes, "We must choose: either to think or to imagine. . . . For it is thought, pure unadulterated

thought, and not experience or sense-perception, as until then, that gives the basis for the ‘new science’ of Galileo.”²⁰ For Plato, the difference between *aisthesis* and *noesis* is a difference of degree (whence, the metaphor of the line); for Descartes and Galileo, it is one of kind.

In Seminar XI, Lacan figures Cartesian subjectivity as forcing a choice between being and thinking. As the passage from Koyré suggests, we might better figure the forced choice as between perceiving and thinking, but the two models can be put together. In Aristotelian metaphysics, *aisthesis* is that faculty through which the being of beings is disclosed to the soul; *noesis* is that faculty through which the truth of beings is discerned. The audacity of Descartes and Galileo is to repudiate the assumption that a homology exists between the being of beings, as revealed in *aisthesis* and the truth of beings, as revealed in *noesis*. It is not through my senses that I perceive what truly belongs to the wax: “I perceive it through the mind alone.”²¹

One way of identifying the elements of C_1 would be to isolate the narrative “events” of the *Meditations*, of which the encounter with (the problem of) the evil deceiver would be one. Another way would be to isolate the series of truths accumulated in the course of the thought experiment, since each of the important narrative events gives rise to the articulation of one such truth. These truths invariably concern one of two things. The first is the existence of an object of a certain sort (sometimes a singular object, such as my soul or God, and sometimes a class of objects, such as other bodies or other souls in general). The second is the causal relations that hold among the objects whose existence has been established. We could therefore take the elements of C_1 to be the set of distinct types of objects whose existence is established and construe the posited causal interaction between any two of these objects (not necessarily a commutative operation) to be something like a binary relation that operates on them. I say “something like” a binary operation, because the operation need not yield a third object that is itself a “group” member, and it need not be the case that the operation can be indifferently applied to all members of the group. But if we take the elements to be fixed and the operation of causal connection to specify a particular way of *linking* the elements, then we can consider any particular stipulated pattern of causal connections to be one possible instance of a larger set of possible transformations.

For example, we could identify the principal elements of C_1 as:

my soul
God
my body
other bodies
other souls

—all of which are brought together in an elaborate causal nexus by the end of the *Meditations*. Using arrows to signify the relationship between a cause and

the object acted upon by that cause (allowing for bi-directional arrows, where commutativity is permitted), we would have:

FIGURE 8.1

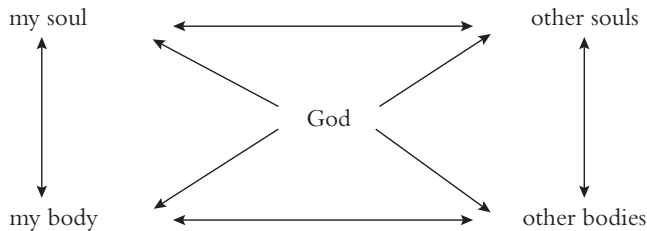
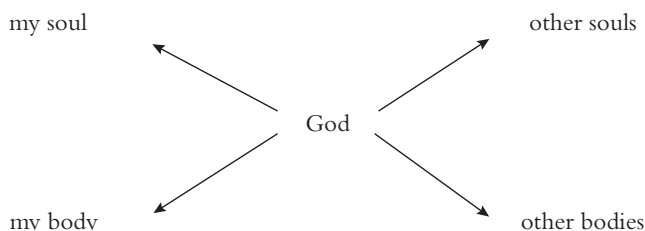


Figure 8.1 illustrates Descartes' conclusion that my soul and body are in causal interaction with each other, as is the soul and body of any other ensouled being; that all bodies are in causal interaction with one another; that the souls of ensouled bodies may enter into causal interactions as well; and that God acts on everything, but that nothing acts on God. Strictly speaking, it is unclear whether Descartes held to all of the details of this "interactionist" model, but this question is in a way immaterial for our purposes, since what matters is not who held which view but what the possible transformations of this basic framework in early modern thought were.²² Thinkers such as Malebranche, Leibniz, Newton, Wolff, and so on were deeply concerned with describing the causal nexus among just these five elements in the right way. In Malebranche, for example, we get the so-called "occasionalist" ontology, which can be represented (see Figure 8.2) as follows:

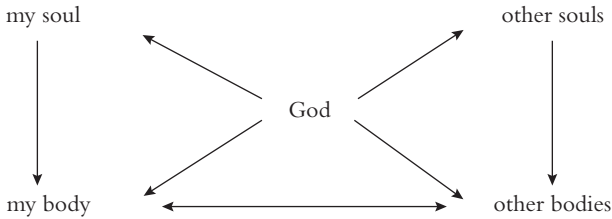
FIGURE 8.2



For the occasionalists, God is the only real agent. Malebranche denies that soul and body interact, famously arguing that God arranges things so that changes in the one correspond to changes in the other. He also denies that there is any real physical interaction between bodies, a view represented in Figure 8.2 by the absence of any arrows connecting "my body" and "other bodies." Finally, he denies that souls can enter into any real interaction with one another. I will call this structural product of the occasionalist thought experiment C_2 .

The Leibnizian thought experiment (see Figure 8.3), in contrast, yields C_3 :

Figure 8.3



For Leibniz, as for Malebranche, there is no genuine causal interaction between souls, but there is causal interaction between bodies. Where Malebranche conceives of the soul as passive, even with respect to its own states, Leibniz takes the soul to be active so that in order to coordinate the states of souls, God must arrange for some sort of preestablished harmony.

My claim is that in order to see what is at stake in the Cartesian thought experiment, we need to consider the series of early modern thought experiments (C_1 , C_2 , C_3 , etc.) as a set of structural transformations.²³ Before proceeding to an analysis of this series, I would like to attenuate matters just one step further by taking a suggestion of Slavoj Žižek’s. In *Looking Awry*, Žižek advances the thesis that certain aspects of theoretical positions (such as thought experiments) can only be revealed by staging them, an act that enables us to “look awry” at the positions in question.²⁴ I will return to the question of why it should be the case that staging a thought experiment can reveal something that we would not otherwise detect, though already we have reason to suspect that it has something to do with the split between *aisthesis* and *noesis*. For now, I will implement Žižek’s strategy by briefly considering a series of films, each of which stages a variant of the fundamental Cartesian problematic—that is, the implication of the disjunction between reality and the real—in an obvious way.

In *Total Recall*, a man named Doug Quaid is haunted by a dream in which he finds himself on Mars involved with a woman other than his wife, a fact that apparently makes his wife jealous. (“I can’t believe you’re jealous of a dream.” “Who is she?” “Nobody.” “Nobody? What’s her name?”) He goes to a clinic called “Recall Incorporated,” where for recreational purposes they implant artificial memories. Quaid asks for a memory sequence in which he will go to Mars, meet a “sleazy” and “demure” woman, and save the planet. In the middle of the memory implant, things go wrong, as he suddenly remembers that his previous identity (as Quaid) was itself a false memory implant; he is really a man named Hauser. He is sedated, and when he awakens again, he thinks of himself as Quaid, but as events transpire, he has reason to think that he might really be Hauser—particularly after his “wife” tells him that they are not really married. (“Sorry Quaid. Your whole life’s just a dream.”) Even—

tually he ends up going to Mars, meeting a woman remarkably like the woman of his dreams, and saving the planet. At the end of the film, standing next to his sleazy and demure partner, he says, "I just had a terrible thought. What if this is a dream?" To which she responds, "Well then kiss me quick before you wake up."

In *The Matrix*, a computer programmer named Thomas Anderson who goes by the hacker name "Neo" finds the words "Wake up" typed onto his computer screen one morning. Following the instructions on the screen, he ends up meeting a woman called Trinity and, through her, a man named Morpheus. Through them Neo discovers that all of his life he has been immersed in some sort of embryonic fluid, attached to an immense computer created by AI (artificial intelligence) forms of life that "grow" humans for the energy output of human brains. Everything that Neo had "experienced" until then had only been the false virtual reality world of "the matrix." Freed from his prison, he trains to reenter the virtual world to be able to save others from it, but it is uncertain whether he is the prophesied "One" who can do this. The prophetess tells him that he is not, but she also tells him that he does not believe in fate. Neo in fact performs an act (saving Morpheus' life) that the prophetess had predicted he would not be able to do. But he gets "killed" in the matrix, the death of his mind there entailing the death of his body as well. Trinity whispers to his dead body that he cannot really be dead, since she loves him and the prophetess has predicted that she would fall in love with the One. After she kisses him, Neo comes back to life (both outside of the matrix and inside of it). He is now able to alter events in the matrix at will and to lead a human rebellion against the AI forms of life.²⁵

In *13th Floor*, Douglas Hall is part of a team of computer programmers who have created a virtual reality world into which they can enter and "interact" with the virtual "subjects" who "live" in that world. After Fuller, the head of the programming team, is murdered, Hall enters the virtual world and finds a message that Fuller had left for him. The message says that if he leaves town and drives far enough, he will discover that the world is "incomplete," thereby revealing its virtuality. He is puzzled, because he knows that this is true of the virtual reality world in which he has received the message and thinks that the message is referring to it. Eventually he discovers that the message in fact refers to what he had thought was the "real" world, which he now learns is itself a virtual world created by computer programmers living in the *real* world. He learns this when he drives to the visually literalized limits of his world, directly encountering, as it were, the fantasy frame of reality. A woman from the "real" world, who has entered his world posing as Fuller's daughter Jane, falls in love with him. Hall eventually joins her in her world after her husband, Hall's "higher" world "user," is killed as he tries to kill his wife while inhabiting Hall's body. The film ends with Hall united with his partner in her world, which turns out to be a utopian California of the future (a newspaper headline reads, "2024 Crime Rates at All-Time Low").

It is obvious that each of these films stages a variation on the key Cartesian thought experiment, and it is instructive to consider which of the variations is at stake.²⁶ *Total Recall*, for instance, might be described as staging the Malebranchian thought experiment, since occasionalism is in effect the doctrine that everyone's experiences are "memory implants." If everything that happens to Quaid is just a dream, then he has not really acted at all; he has merely passively experienced the events that have been "downloaded" into him by the big Other.²⁷ In contrast, *The Matrix* might be said to stage the Leibnizian doctrine of preestablished harmony.²⁸ Outside the matrix, human bodies really do interact, but inside the matrix, their "souls" only appear to interact, since each mind merely experiences events that are "in synch" with the events experienced by others. These experiences are not merely passively received, though, since each "soul" is capable of effectively altering its condition in the matrix. Thus we have all of the ingredients of C₃. In *13th Floor*, finally, we have the staging of the interactionist doctrine—that is, the view that there is real interaction between soul and body, soul and soul, and body and body, for the suggestion is that the subjects who live in their respective virtual worlds are *not*, as in *The Matrix*, merely living in a dream; both they and their worlds are "just as real" as any higher-level reality, a point insisted on by characters who ask higher-world users to leave them alone and let them live their own lives. The fact that only some of these souls (apparently) have bodies while others do not only shows that there is room for nonstandard forms of embodiment (or perhaps angels) in the interactionist doctrine.

What exactly do these films reveal about the early modern thought experiments that they stage? I suggest that each of the films discussed has as its central topic a worry about the ontological status of the sexual relationship. We have already seen this to be the case in *Total Recall*, a film that begins and ends with the suggestion that a successful sexual relationship exists only within the realm of fantasy. Trying to placate his wife, who is jealous of the woman he's been dreaming about, Quaid says to her, "Come on, baby, you know you're the girl of my dreams," but the fact that he still wants to go to Mars indicates that his relationship with her is not fulfilling. Later, when he points a gun at her after she has tried to kill him, she says, "Sweetheart. Be reasonable. After all, we're married"—at which point he shoots her in the head and says, "Consider that a divorce." The idea that he would have to kill his wife *because* she was trying to kill him is obviously an element of the fantasy that enables Quaid to be with the (sleazy and demure) girl of his dreams in a guilt-free way. *Total Recall* could thus be said to stage the thesis that the sexual relationship takes place only at the level of fantasy.²⁹

In *The Matrix*, the sexual relationship is figured in terms of the feminine relation to the divine. In effect, the film stages the transition from a world governed by the evil deceiver to a world governed by a benevolent God. The Christian symbolism that recurs throughout the film places Neo in the position of Jesus and Trinity in the position of Mary Magdalene. When Trinity kisses Neo's corpse, thereby causing his resurrection, the possibility of their sexual re-

lationship is guaranteed solely insofar as he is “the One.” Once again, it is a fantasy of a certain sort that sustains the sexual relationship.

The connection between fantasy and the sexual relationship is evident in *13th Floor* as well. Fuller enters the virtual world for the sole purpose of having sex with prostitutes. His position in the film therefore corresponds to Quaid's in *Total Recall*, and his murder early on indicates that the film has another agenda, one that concerns the relationship between Hall (who, notably, has the same first name as Quaid) and the woman claiming to be Jane Fuller. Earlier I suggested that this film can be read as staging the doctrine of interactionism. At the end of the film, the happily united couple have entered a supposedly “real” world that is obviously fantasmatic. In this sense, what is being staged is the fantasy that the sexual relationship could really exist outside of fantasy. Of course, this is to say that the role of fantasy is not absent even here, but it is to call attention to the difference between fantasy as that which provides an “escape” from reality and fantasy as that which seeks an idealized transformation of reality.³⁰

Read in this way, our films suggest that just as for Lévi-Strauss, the myths of South America are “really” about cooking as that which marks the transition from nature to culture, so the early modern thought experiments of Europe are “really” about the loss of the sexual relationship as that which marks the transition from Aristotelian metaphysics to modern science. In fact, Lacan suggests as much in the passage from “Science and Truth,” cited above, where he speaks of Descartes as “safeguarding the ego's partner.”

One of the recurring themes of Seminar XX concerns the difference between an Aristotelian approach to the divine and a post-Cartesian approach. For Aristotle, the subject's relationship to the prime unmoved mover is precisely a relationship of love, and that relationship in turn serves as a kind of guarantee of the sexual relationship. After Descartes and Galileo, Lacan suggests, that relationship becomes problematic. As long as science remained Aristotelian, that is, as long as it was concerned solely with “reality,” as Lacan understands this term, it remained within the confines of fantasy. What happens in modernity is that a science of reality gives way to a science of the real, where the real is that which can be approached only by way of a pure *noesis*. Because the rise of modern science depends upon an extrusion of *aisthesis* from the domain of the real, the cogito (or subject of science) finds itself without a world—that is, without the fantasy frame that sustained the Aristotelian cosmos. If fantasy is that which alone makes the sexual relationship possible, then the anxiety associated with modern science arises from the disclosure of the subject's relationship to a “real” radically other than reality.

Consider again the scene in *13th Floor* where Hall appears to “traverse the fantasy,” discovering the literal fantasy frame of his world. (“I know the truth.” “Where are you?” “You could call it the end of the world.”) One way of reading this scene would be to say that it mimics the Galilean and Newtonian gesture whereby the subject discovers its subordination to the signifier. What is traumatic in $F = ma$, I suggest, is that the equation in question is a way of

naming the real—that is, of disclosing the subject's *agalma*, as Lacan puts it elsewhere. Galileo said the book of nature was written in mathematical symbols. To discover that this is so is exactly akin to discovering that “my whole world” is a simulacrum conjured by a bunch of computers, a discovery that gives rise to a certain “aphanisis” of the subject, where this term connotes both a sense of despair and a concomitant loss of sexuality.³¹ In *The Metastases of Enjoyment*, Žizek associates aphanisis with what he calls “feminine depression,” the suggestion being that it is feminine subjectivity that perpetually runs the risk of despair and loss of world.³² What *13th Floor* brings out is that it is the masculine Cartesian subject who is especially prone to this “feminine” depression. Hall's interest in Fuller's daughter disappears after his discovery, and the possibility of their having a sexual relationship comes to hinge on her bringing him within her fantasy frame—or, in the terms of ego psychology, on his being able to reconstruct a sense of reality (i.e., a fantasy) that matches hers. (“From the moment this simulation was created, I've watched you . . . I fell in love with you before I even met you.” “How can you love me? I'm not even real. You can't fall in love with a dream.” “You're more real to me than anything I've ever known.”) Note the reversal of the problematic staged in *Total Recall*. For Doug Quaid, the problem is that his ideal sexual partner may exist only in his dreams; for Doug Hall, the problem is that he may exist only in the dreams of his ideal sexual partner. To the extent that the film ends with Hall's reintegration into the frame of his original fantasy—he is again a “real” person with an identity confirmed by the paternal presence of Fuller's higher-world “user”—we could say that he does not truly traverse the fantasy in Lacan's sense. We also could say that the passage from Hall's aphanisis to his recovery of reality marks the passage from his worrying that he lives in an occasionalist world to his belief that he lives in an interactionist world.

What then can we conclude about C₁? The Cartesian subject “loses its world” when it discovers itself qua cogito or subject of the signifier in the second Meditation, but it attempts to reestablish that world, rather in the manner that Freud describes the psychotic's attempt to recreate reality. Thus we can read the Cartesian thought experiment as exhibiting three crucial features: (1) it enacts the passage from reality to the real, thereby giving rise to the problem of the evil deceiver; (2) it reestablishes reality insofar as the transition from evil deceiver to benevolent God is effected; and (3) it bears witness to an ongoing anxiety about how to reconcile the new mathematical physics, a science of the real, with the familiar parameters of reality. That anxiety, Lacan argues, *is* the anxiety over the sexual relationship.

Thus what Lacan means when he says “there's no such thing as the sexual relationship” is that, after the rise of modern science, the split between *noesis* and *aisthesis* corresponds to the subject's aphanisis, where that aphanisis is to be understood primarily in terms of the loss of world. The various thought experiments, C₁, C₂, C₃, and so on, are ways of trying to rethink the ontological status of the sexual relationship.

It needs to be kept in mind that the early modern thought experiments are metaphysical in character. The elements of the Cartesian “group” are *beings* whose mode of being is at issue. In other words, far from drawing the consequences of the rise of modern science, the early modern thought experiments are ways of “not wanting to know anything about it,” to cite a Lacanian phrase. Modern metaphysical thinking seeks a way of identifying the real with a reality of spatial bodies revealed in *aisthesis* while at the same time separating the subject (the soul) from the realm of spatial bodies. In this way, not only does modern science seek to identify the real with reality, it simultaneously tries to exempt the subject from the realm of the bodily, that is, from the realm of the mathematizable. This last point, of course, is a truism: mind/body dualism and its kindred alternatives are ways of “saving” the subject; in particular, it seems as though the only way of preserving the autonomy of the subject is to show that the subject’s position within the causal nexus—this nexus now known to be governed by mathematical laws—somehow exempts the subject from being reduced to an object of these laws. All of the thought experiments above are ways of wrestling with this problem in one way or another.

Thus if the subject of science emerges as that which is capable of thinking the truth of beings in mathematical terms, it simultaneously appears as that which resists the reduction of its own truth to those same terms.³³ This, I take it, is what is staged in the films discussed above, each of which proposes a different way of “saving” the subject, of refusing to allow the subject to be reduced to the signifier. By insisting that there is always something in a subject that is “more” than the signifier (or computer program) that constitutes it, both *The Matrix* and *13th Floor* affirm the autonomy of the subject; in both cases, it is the subject’s ability to “wake up” that saves it from the signifier. In *Total Recall*, it is the exact opposite: the subject precisely does not want to wake up or, again, “doesn’t want to know anything about it.” But even here, the subject is the site of a certain excess, in this case, of enjoyment (“Kiss me quick”).³⁴

LACAN'S MATHEMATICS OF THE SIGNIFIER

It is not enough to say that modern science is mathematical, since Aristotelian science could already accommodate a certain mathematization of *aisthesis*, as, for example, in the Ptolemaic model of the heavens. What distinguishes modern science is a certain type of mathematics, one based not on the sign (object of *aisthesis*) but on the signifier (object of *noesis*). For Aristotle, mathematical entities are mere abstractions derived from our perceptions of the visible world. Understood in this way, our sense of the necessity of mathematical truths—such as that the shortest distance between two points is a straight line, that the sum of the angles of a triangle is 180°, that $2 + 2 = 4$ —is grounded in our perception of the visible world. We know that Euclid’s axioms are true *because we see*, that is, because the evidence of *aisthesis* reveals that this is so. Descartes

repudiates this type of justification. We do not know because we see; we know because we think. If it is true that $2 + 2 = 4$, we can determine that it is true not by counting apples but simply by *counting*.³⁵

Lacan suggests that the consequences of the liberation of *noesis* from *aisthesis* are incalculable:

What does this imply, if not that we will be able to begin playing with the small algebraic letters that transform geometry into analysis, that the door is open to set theory, that we can permit ourselves everything as a hypothesis of truth?³⁶

To be sure, Lacan is not explicitly speaking here of the separation of *noesis* from *aisthesis* but of that “handing back of truth into the hands of the Other” by which Descartes affirms that God could have made it the case that $2 + 2 = 5$. But what does it mean to ascribe such a capacity to God? It means, I suggest, that *everything which can be thought must be possible*, so when Lacan says that Descartes paves the way for the algebraization of geometry, the development of set theory, and so on, he is pointing out that post-Cartesian mathematics is freed from the constraints of *aisthesis*. That there are truths concerning, say, numbers whose square is equal to -1 does not require that the being of such numbers be demonstrated. This is precisely what it means to say that a mathematics of signs has given way to a mathematics of the signifier. To motivate truths about complex numbers, all that is needed is a certain mathematical formalism of the sort that Viète and Descartes articulate. The algebraic letters with which they write equations do indeed appear within *aisthesis*, but only insofar as they make possible the articulation of truths, not insofar as they stand in for beings. Here we see why Lacan requires that a mathematical formalism be written: it is not because he reinstates a metaphysics of signs, as the Derridean suggests, but because he thereby marks the advent of modern science as something precisely other than a metaphysics of presence.³⁷ The fact that nothing in reality corresponds to negative, complex, or transfinite numbers, that I cannot intuit Lobachevskian or Riemannian or n -dimensional space, does not in the least compromise the truths I can grasp by thinking such objects.³⁸

The gap between modern science and Aristotelian science might not seem so great, for it is easy to imagine that an “educated” *aisthesis* might come to perceive the new truths revealed by the new science, as when we learn to “see” not the sun rising but the earth turning. But as Koyré points out, for Galileo we do *not* see that the law of gravity is true, nor do we *confirm* the law of gravity through physical experiments, since all genuine justification takes place at the level of the thought experiment: “Good physics is made *a priori*.”³⁹ For Lacan, the gap is completely radical, since it is not a question of substituting one “picture” of the world for another but of substituting mathematical equations for pictures.⁴⁰ It is thus the truth of beings—not necessarily the being of beings revealed in *aisthesis*—that modern science reveals. This means that there is a radical disjunction between the order of the mathematical and the order of

perception—or, to invoke Lacan's dispute with phenomenology, that the order of the signifier is radically other than the order of "lived experience."

Of all modern philosophers, no one has been more aware of the fact of this disjunction than Heidegger, whose sole philosophical enterprise was to summon thinking back to what he takes to be its proper (essentially Aristotelian) task, namely, to think the being of beings as this is revealed in *aisthesis*.⁴¹ Lacan's strategy is the exact opposite. His aim is to show that the split between *aisthesis* and *noesis* has not been sufficiently appreciated.⁴² If Heidegger can be said to attempt to reclaim the being of beings by thinking the history of the truth of beings in terms of the way in which that truth itself unfolds within *aisthesis*, Lacan attempts to accentuate the encounter with the real that thrusts subjectivity within the domain of the truth of beings (i.e., the symbolic order), thereby definitively exiling the subject from the being of beings. It is the difference between an attempt to reestablish reality and an attempt to confront that loss of reality, which is the true consequence of modern science. Or, put otherwise, it is the difference between a discourse that sees in anxiety the mark of the subject's being-in-the-world and a discourse that sees in anxiety the mark of the subject's not-being-in-the-world.⁴³ From a Lacanian perspective, the Heideggerian enterprise would be a way of attempting to reclaim the possibility of a sexual relationship, despite the rise of modern science. As such, it has the character of a refusal.

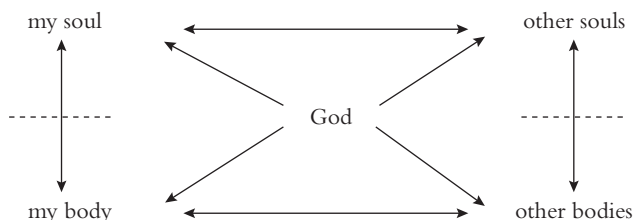
TOWARD A SCIENCE OF THE REAL

One of the difficulties associated with the Cartesian thought experiment is that we seem to be faced with a choice: either souls and bodies are different in kind, in which case it is difficult to conceive of how they could interact (this is the line of argument that seems to lead directly from Cartesianism to occasionalism), or they interact, in which case it is not clear that they differ in kind at all. If we opt for the latter alternative, we can do so from either an idealist (Berkeleyan) or a materialist (Hobbesian) perspective. The Berkeleyan position requires that we give up the domain of bodily interaction altogether, but the Hobbesian position implies that the cogito is just as subject to the signifier—that is, to the Newtonian laws of nature—as any physical object.

In his earliest writings, Kant attempted to address this dilemma by bringing together Newtonian physics and Leibnizian metaphysics. Against the doctrine of preestablished harmony, he maintains that souls can have real interactions with one another, just as bodies do. He also claims that souls interact with bodies. But he preserves the subject's independence from the signifier by suggesting that the spatiality of bodies is a consequence of a repulsive force exercised by simple substances (including souls) in their repelling of one another. What we might call the "space of intercorporeality" thus ends up being an extension of a metaphysically prior "space of intersubjectivity," so rather than having to face the deterministic implications of Newtonian physics (which grants autonomy to the space of intercorporeality), Kant can affirm the

autonomy of subjects, despite their participation in the space of intercorporeality. The two spaces are governed by different sorts of laws, the space of intersubjectivity by moral laws, and the space of intercorporeality by mathematical laws. By insisting on the fundamental difference between these two spaces, or between the moral and the mathematical, Kant is able to fully accept the subject of science while maintaining a proper “distance” between the subject and the signifier. We might diagram this position (see Figure 8.4) as follows:

FIGURE 8.4



The dotted line is intended to indicate the difference in kind between the (upper) space of intersubjectivity and the (lower) space of intercorporeality.

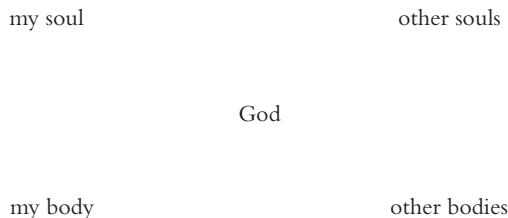
Why did Kant ultimately find this resolution of the problem unsatisfactory? One way of putting the answer to this question would be to say that, like Doug Hall in *13th Floor*, he discovered its fantasmatic character. In particular, reading Emanuel Swedenborg’s *Arcana coelestia* obviously had a profound effect on Kant, as we can tell from his “Dreams of a Spirit-Seer.” In this essay, Kant chides himself for having advocated metaphysical theses strikingly close to what he takes to be the obviously fantasmatic visions described by Swedenborg (whose first name, perhaps not incidentally, was the same as Kant’s). Like Kant, Swedenborg holds that there is a community of souls distinct from the community of bodies, and that the former exhibits spatial relations of exactly the same sort as the latter. Kant rebels against this view, and he does so in a manner that is highly instructive. He does not deny that there might be a community among souls distinct from the community among bodies. What he denies is the idea that any of the sensible properties that characterize the space of intercorporeality can be presumed to hold for the space of intersubjectivity, and yet he does this without giving up on the idea that some sort of causal interaction might nonetheless take place between the two spheres (this is the crucial point he will defend in the third and fourth antinomies of the first *Critique*). Because the space of intersubjectivity is merely something that we conceive of without being able to perceive, we can approach it only through fantasy:

All judgements, such as those concerning the way in which my soul moves my body, or the way in which it is now or may in the future be related to other beings like itself, can never be anything more than fictions—fictions which are, indeed, far from having even the value of those which feature in natural science and which are called hypotheses.⁴⁴

What exactly is Kant doing when he insists here, as he will later in the first *Critique*, that a sharp distinction be drawn between science and metaphysics? I can only briefly indicate a proper answer to this question, but I suggest that Kant's crucial philosophical gesture is to think even more rigorously than Descartes the radical difference between *aisthesis* and *noesis*. For Descartes, this distinction did not prevent the subject of science from being capable of drawing metaphysical conclusions: the discovery of the truth of beings entitles the cogito to say something about the being of beings. Kant's doctrine is much more austere. To say that intuitions and concepts are radically different in kind, that the being of beings revealed in sensibility and the truth of beings revealed in thought are utterly heterogeneous, is to say that nothing whatsoever can be known about the being of beings. At first, this sounds paradoxical, since if sensibility discloses the being of beings to us, why should that disclosure not count as a knowing? This is precisely the objection that Heidegger levels against Kant, for reasons I have already indicated, but Kant's thesis is arguably more radical than Heidegger appreciates. Yes, the being of beings is in some sense disclosed in sensibility, but *aisthesis* does not count as a knowing. In Lacanian terms, what Kant argues for is the imaginary character of objects of *aisthesis*, a consequence of their being located in a kind of "pure fantasy frame" (the forms of intuition). This is why it is necessary to distinguish between the ersatz knowledge that can be attained in science (through the application of categories of the understanding to objects given in sensibility) and that foreclosed metaphysical knowledge for which reason strives in vain. Kant never gives way on the thesis that the radical heterogeneity between *aisthesis* and *noesis* marks a fundamental split between science, by which the subject can acquire knowledge of the space of intercorporeality, and metaphysics, by which the subject can only think problematic thoughts about the character of a "space" of intersubjectivity among (themselves problematic) souls.

The Kantian thought experiment thereby institutes something new. It cannot be represented as another permutation of the Cartesian group, because *its elements are not beings*—or, to put the point in Lacanian terms, because it "puts a bar" through each of its terms. In other words, what had been the Cartesian group represented below (in Figure 8.5)

FIGURE 8.5



might now be schematically represented something like this (see Figure 8.6):

FIGURE 8.6

$$\frac{\mathcal{S}}{S_1} \quad S(\mathcal{A}) \quad \frac{a}{S_2}$$

Here \mathcal{S} is no longer a soul but the subject that can only think itself problematically as soul, S_1 is my body (as object of both inner and outer intuition) insofar as this is how I appear (i.e., “am represented”) within reality; S_2 represents other bodies or the sum-total of these as the locus of the space of intercorporeality; “a” stands for that in these bodies which I take to be “more” than their bodies, that is, their souls, which do not appear in *aisthesis* but which I think problematically as I do my own soul (the sum-total of these constituting the problematic space of intersubjectivity); and $S(\mathcal{A})$, finally, is the Kantian God whose very possibility is itself merely problematic.

To say that the subject-in-itself now appears only as problematic for a body that takes itself as object of inner sense is to suggest that it would be more proper to invert the top and bottom levels of the diagram (i.e., for reasons analogous to those for which Lacan inverts Saussure’s diagram of the relationship between signifier and signified). This gives us

FIGURE 8.7

$$\frac{S_1}{\mathcal{S}} \quad S(\mathcal{A}) \quad \frac{S_2}{a}$$

—which of course is basically Lacan’s discourse of the master.

In saying this, I do not mean to imply that Lacan is merely restating the Kantian discourse. Elsewhere, I have argued that metapsychology can be construed as the perverse “flip side” (*envers*) of transcendental philosophy.⁴⁵ Each of the judgments Kant construes as synthetic a priori is read by psychoanalysis as belonging to a class of statements that Kant forecloses, namely, the analytic a posteriori. Instead of repeating or correcting the details of that analysis, what I would like to do here is show that when Lacan poses the problem of the mathematizability of psychoanalysis, he is addressing a problem explicitly thematized by Kant.

Kant separates the subject from the signifier in two different ways. On the one hand, he does so by equating the subject with the “I” of apperception which, as such, cannot become an object of intuition at all. No rational psychology can yield knowledge of the soul, since the soul is itself merely problematic: if Kant does not “save” the subject, he thereby saves the possibility of saving the subject. But Kant also argues that not even the subject qua object of inner sense can be understood in mathematical terms. His brief argument turns not on some radical incompatibility between inner intuition and mathematics but solely on the presumed poverty of the mathematical properties of lines:

Mathematics is inapplicable to the phenomena of the internal sense and their laws, unless one might want to take into consideration merely the law of continuity of the flow of this sense's internal changes. But the extension of cognition so attained would bear much the same relation to the extension of cognition which mathematics provides for the doctrine of body, as the doctrine of the properties of the straight line bear to the whole of geometry.⁴⁶

Kant's idea is this. As object of inner sense only, I appear to myself in time but not in space. For this reason, the only mathematical concepts that could possibly be applicable to a science of inner sense would be the concepts of arithmetic—or, equivalently, those geometrical concepts that concern the properties of a one-dimensional object (i.e., a line). But *lines lack mathematical structure*, and for this reason any purported mathematical psychology would be a poor cousin of mathematical physics.

Actually, lines have a much richer mathematical structure than Kant realized, and much of topology—particularly knot theory—can be construed as an elaboration of just this.⁴⁷ For this reason, it is tempting to suggest that Lacan is taking up the Kantian gauntlet when he appeals to the theory of knots and links to spell out the details of his metapsychology. Obviously it is not a question of saying that psychoanalysis is a science of “inner sense,” but one of challenging Kant's argument that mathematical concepts have no possible employment beyond the limits of possible experience.⁴⁸ One of the first thinkers to challenge this Kantian claim was Frege. In *The Foundations of Arithmetic*, Frege grants to Kant his well-known thesis that geometric statements are synthetic a priori, but he denies that the same holds for arithmetic statements. Frege's argument is worth quoting at length:

Empirical propositions hold good of what is physically or psychologically actual, the truths of geometry govern all that is spatially intuitable, whether actual or product of our fancy. The wildest visions of delirium, the boldest inventions of legend and poetry, where animals speak and stars stand still, where men are turned to stone and trees turn into men, where the drowning haul themselves up out of swamps by their own topknots—all these remain, so long as they remain intuitable, still subject to the axioms of geometry. Conceptual thought alone can after a fashion shake off this yoke, when it assumes, say, a space of four dimensions or positive curvature . . . For purposes of conceptual thought we can always assume the contrary of some one or other of the geometrical axioms, without involving ourselves in any self-contradictions . . . The fact that this is possible shows that the axioms of geometry are independent of one another and of the primitive laws of logic, and consequently are synthetic. Can the same be said of the fundamental propositions of the science of number? Here, we have only to try denying any one of them, and complete confusion ensues. Even to think at all seems no longer possible . . . The truths of arithmetic govern all that is numerable. This is the widest domain of all; for to it belongs not only the actual, not only the intuitable, *but everything thinkable*.⁴⁹

Read through a Lacanian lens, Frege is here suggesting that, while geometry pertains to the realm of fantasy (i.e., to any possible intuitable reality), arithmetic pertains to the order of the real. He grants to Kant that geometric concepts may not be applicable beyond the fantasy frame of reality but maintains that it is otherwise in the case of numerical concepts.

It was Jacques-Alain Miller who called attention to the relevance of Frege's text to Lacanian theory, arguing that the subject's relationship to the signifier could be understood in terms of Frege's account of the ontological status of numbers.⁵⁰ Here I would only add to that analysis the observation that it is Frege's understanding of the radical difference between geometry, a science that belongs to *aisthesis*, and arithmetic, construed by Frege to be a science that belongs solely to *noesis*, that makes possible the further claim that the concepts of number are applicable even beyond what Kant identifies as the limits of possible experience.⁵¹

How might it be possible to develop a mathematical account of the subject? I will not rehearse the details as Miller lays them out but will instead suggest that there are two possible options here. The first would be to include the "soul" within the realm of reality—that is, to reduce the space of intersubjectivity to the space of intercorporeality. We deny that the unity of apperception indicates the irreducibility of subjectivity to the physical and seek within empirical reality a way of understanding the genesis of subjectivity in strictly empirical terms. For example, suppose we take the Kantian distinction between outer and inner intuition to mark the difference between an organism's awareness of its environment and its awareness of its internal bodily states. Suppose we account for the organism's awareness of this difference by assuming that it is susceptible to two different sorts of sensations—those it can alter through bodily movements and those it cannot. Suppose the organism has a tendency to discharge the energy conveyed to it through its internal sensations, but it is impossible to eliminate these entirely, and so on. Obviously, I am reconstructing the analysis that Freud presents both in his 1895 "Project" and in *Beyond the Pleasure Principle*. We know that Freud never entirely gave up the idea that an adequate science of the mind might one day reduce metapsychology to a chapter of empirical psychology. To say this is to say that Freud took his cue from the idea of a science of reality.

The second alternative would be to accept the subject's noninclusion in empirical reality and to take seriously the Koyrean idea that modern science is essentially a science not of reality but of the real. To pursue this line of thought is to begin not with an organism embedded in a pregiven space but to begin with the problematic idea of a subject that cannot be described in terms of any empirical properties whatsoever. Suppose we take seriously the idea that such a subject belongs first and foremost to something like a space of intersubjectivity—a space, however, whose character can be conceived of only in numerical, not geometrical, terms. Such a space might be conceived of as a network of signifiers, and the way to propose a mathematization of the subject would be to

seek a model for understanding the advent of subjectivity in the linking of signifiers.

The Borromean link provides Lacan with precisely such a model.⁵² In Seminar XX, this model plays many different, though interrelated, roles. First it serves as a way of diagramming a particular discourse, as when Lacan cites his earlier use of the model to illustrate the sentence, "I ask you to refuse what I offer you" (126). This is a particular statement supposed to characterize a particular subjective symptom, and the aptness of the Borromean model lies with the supposed homology between the symptom in question and the topological features of the link. Once we see how the Borromean link can serve as a model for a particular symptom, we also see how, second, it can serve as a model for the symptom in general. In order to fulfill this double requirement, Lacan will turn in later seminars to a variety of links, each meant to illustrate a particular type of symptom; in Seminar XX, the Borromean link serves both functions. It also represents, third, not just the particular discourse mentioned above but discourse in general. In particular, Lacan associates a Borromean chain of some finite number of rings with a sentence, each link in the chain being a particular signifier (128). Fourth, the Borromean link is used to represent "the social link," which enables us to think of each ring as a particular subject, or of each ring as the signifier of a subject. Thus in chapter 5 he says:

In the final analysis, there's nothing but that, the social link. I designate it with the term "discourse" because there's no other way to designate it once we realize that the social link is instated only by anchoring itself in the way in which language is situated over and etched into . . . speaking beings. (Seminar XX, 54)

Finally, the Borromean chain provides Lacan with a model of the unconscious. In *The Ego and the Id*, Freud provides a diagrammatic model of the psychic apparatus. This model is intended to map the "space" of the subject precisely insofar as that space is modeled on the organism's location in physical space. Lacan reverses Freud's strategy. His Borromean diagrams, particularly in the later seminars, also are intended to map the spatiality of the subject, but precisely not on the model of the organism's location in physical space. On the contrary, the Lacanian gamble is to wager the reverse: that only if we begin with a topological representation of the subject, insofar as it is "located" within the linking space of signifiers, will we be able to give an account of how the subject accedes to that imaginary representation of physical space that will forever after count for the subject's ego as the locus of the subject's existence. Only if we read Lacan in this way can we appreciate the radicality of his strategy, for it literally requires us to assume that all of phenomenal "reality" has the character of a dream whose hidden ground—the real—can only "appear" as a problematic *x*, as a signifier, as a stain within *aisthesis*.⁵³

Recall that Kant transforms the Cartesian thought experiment by distinguishing between a space of intersubjectivity and a space of intercorporeality,

arguing that the space of intercorporeality is itself generated by relations of force that souls—or, in Leibnizian terms, monads in general (i.e., simple substances, only some of which are souls)—exert on one another. That there are spatial relations among bodies would be a consequence of the fact that there are relations of *another kind* between subjects.⁵⁴

But suppose we take the relations in question to be not relations of force (which is to remain within Freud's geometrical model) but, precisely, *linking* relations:

The signifier as such refers to nothing if not to a discourse, in other words, a mode of functioning or a utilization of language qua link. . . . *The link . . . is a link between those who speak.* (Seminar XX, 30, emphasis added)

Because the spatiality of these linking relations would not be understood in terms of a pregiven space, it would be necessary to conceive of the genesis of intersubjective “space” in terms of the linking of signifiers. Moreover—and here is where the thought experiment becomes especially audacious—if *aisthesis* itself is to be explained as a consequence of the genesis of that space, then one of the tasks of such a project would be to try to establish how the social link might give rise to something like forms of intuition, that is, to the conditions under which the space of intercorporeality can appear in *aisthesis*. I take it that this is the sort of question Lacan has on his mind when he says:

What is important is not that there are three dimensions in space. What is important is the Borromean knot and that for the sake of which we accede to the real it represents to us. (Seminar XX, 132–33)

When Freud proposes his (Newtonian) model, he explicitly characterizes it as speculative. Similarly, Lacan claims that the subject can only be supposed—by which I read him as calling attention to a certain irreducibly speculative character of his topology. In his essay on Poe, Lacan had already focused on the way in which the linking of signifiers gives rise to a structuring of the real that would otherwise not exist.⁵⁵ In Seminar XX, he has found a way of illustrating how the linking of signifiers can give rise to a structure that is spatial in character. The space of intersubjectivity would be, as it were, the condition for the possibility of the appearing of the real within the (imaginary) space of intercorporeality. To say this is not to say that the subject literally moves about in some Swedenborgian moral space, but to explain how discourse can be thought of as a textured surface, whose warp and woof are the site of the appearance of subject and world.

This is why psychoanalysis has as its goal a mathematical formalization. But such a formalization, as we have seen, tends toward the production of (Joycean) nonsense. That is not a criticism but an assessment of the way in which psychoanalysis approaches the limits of thought.

Earlier I promised to return to the question of why it should be the case that “staging” theoretical positions might bring out something in them that we could not otherwise see. One way of answering this question would be to suppose that theoretical positions such as thought experiments are never truly “pure,” because they always bear within themselves some “stain” of *aisthesis*. To take this view is to suggest that the split between *aisthesis* and *noesis* is never truly radical, that the very idea of a pure cogito is a symptom of something amiss. Staging the cogito's attempts at pure *noesis* would then be a way of unmasking the cogito's pretension to autonomy. This kind of explanation assumes that the split between *aisthesis* and *noesis* is something secondary in relation to the subject's being-in-the-world.

Following Žizek, I would like to suggest another explanation. By insisting on the difference between reality and the real, Lacan invites us to take seriously the distinction between *aisthesis* and *noesis*. If the two are different in kind, then to stage a thought experiment is to subject the cogito to something wholly other. Understood in this way, it is not the discovery of a secret affinity that makes possible a moment of insight in the staging of theoretical motifs but something that happens in the revelation of a radical dis-affinity. The same could be said of the staging of any written play. When it is staged, what surprises is not the discovery of “something that was there all along in the text” but the discovery of something that, although it precisely does not belong to the text, although it is something that the text might even resist, nonetheless belongs to it as an uncanny “other” that it cannot entirely disavow. A slip of the tongue is, of course, the classic psychoanalytic example of such a “staging.”

I suspect that something similar can be said about the relationship between the Lacanian thought experiment and the various attempts that Lacan and others have made to stage it in mathematical terms. If so, this would explain why Lacan can say both that mathematical formalization is the goal of psychoanalysis and that, “The analytic thing will not be mathematical” (Seminar XX, 117). For what is a *matheme* if not an object of *aisthesis*?

NOTES

1. Jeanne Granon-Lafont, *La Topologie Ordinaire de Jacques Lacan* (Paris: Point Hors Ligne, 1985). Cf. the articles collected in *Littoral* 5 (June 1982).

2. Joël Dor, “The Epistemological Status of Lacan's Mathematical Paradigms,” trans. Pablo Nagel, in *Disseminating Lacan*, eds. David Pettigrew and François Raffoul (Albany: State University of New York Press, 1996), pp. 109–21.

3. Note that for Lacan the same point would presumably hold for any attempt to “translate everything,” that is, whether or not one is translating into *mathemes*, since “*on ne saurait tout dire*” (39). Cf. pp. 22 and 26, as well as Bruce Fink's notes on the translation of *tout dire*.

4. See Derrida's introduction to Husserl's "Origin of Geometry," where the contrast between Joycean plurivocity and Husserlian univocity is drawn. Jacques Derrida, *Edmund Husserl's Origin of Geometry: An Introduction*, trans. John P. Leavey Jr. (Stony Brook, N.Y.: Nicolas Hays, 1978), p. 100ff.

5. Jean-Luc Nancy and Philippe Lacoue-Labarthe, *The Title of the Letter: A Reading of Lacan*, trans. François Raffoul and David Pettigrew (Albany: State University of New York Press, 1992).

6. Quine, for example, refers to a metalanguage as "the ordinary unformalized language in which I describe and discuss the object language." See W.V. Quine, *Philosophy of Logic*, 2d ed. (Cambridge: Harvard University Press, 1986), p. 36. Instead of "metalanguage," Carnap refers to the "syntax language."

7. In this way, it becomes possible to block certain paradoxes such as that of the Cretan liar. The strategy is to stipulate that in the object language it is impossible to construct sentences of the type, "This sentence is false." One then appeals to the meta-language to define "is true" and "is false" for the language in question. Note that in Seminar XI, Lacan discusses the paradox of the Cretan liar, appealing to his distinction between the "subject of the enunciation" and the "subject of the enunciated" to make sense of it. See Jacques Lacan, *The Four Fundamental Concepts of Psycho-Analysis*, trans. Alan Sheridan (New York: W.W. Norton, 1978), pp. 138–42.

8. The term also is used by Hjelmslev. See the discussion in Oswald Ducrot and Tzvetan Todorov, *Encyclopedic Dictionary of the Sciences of Language*, trans. Catherine Porter (Baltimore: Johns Hopkins University Press, 1979), p. 23. Lacan seems to have picked it up by way of Jakobson.

9. In this respect, Lacan—again like Derrida—suggests that there is no simple way of getting beyond metaphysics.

10. Jacques Lacan, "Science and Truth," trans. Bruce Fink, in *Newsletter of the Freudian Field* 3 (1989): 4–29.

11. *Ibid.*, p. 14.

12. Lacan, *The Four Fundamental Concepts*, 36.

13. Incipit Marx. Or one might think of a joke about Moses and Jesus playing golf. Jesus just barely misses a putt, but then uses his miraculous powers to make the ball go into the hole anyway, at which point Moses says, "Do you want to fuck around, or do you want to play golf?" One could similarly imagine Gauss asking God, "Do you want to fuck around, or do you want to do math?" Incidentally, or not so incidentally for psychoanalysts, at a young age Gauss corrected a mistake in his father's accounting book.

14. René Descartes, *Meditations on First Philosophy*, 3rd ed., trans. Donald A. Cress (Indianapolis: Hackett, 1993), pp. 16–17.

15. *Ibid.*, p. 18.

16. *Ibid.*, p. 35.

17. Slavoj Žižek does something similar in a fascinating reading of Kafka's *The Trial*. See his *Looking Awry: An Introduction to Jacques Lacan through Popular Culture* (Cambridge: MIT Press, 1991), p. 147ff.

18. Consigning a pun to an end note, not the "key myth" of the Bororo but the "key thought experiment" of the Borromo.

19. Descartes, *Meditations on First Philosophy*, p. 19; emphasis added.

20. Alexandre Koyré, "Galileo and the Scientific Revolution of the Seventeenth Century," *The Philosophical Review*, vol. LII, no. 310 (July 1943): 346.

21. Descartes, *Meditations on First Philosophy*, p. 22.

22. For a discussion of both the debate in Descartes scholarship and the dispute in early modern thought about how to conceive of the proper nexus of causal relations, see Kenneth Clatterbaugh, *The Causation Debate in Modern Philosophy 1637–1739* (New York: Routledge, 1999). A discussion of the three principal early modern positions I will be discussing (as well as of the Kantian intervention) can be found in Alison Laywine, *Kant's Early Metaphysics and the Origins of the Critical Philosophy*, North American Kant Society Studies in Philosophy, vol. 3 (Atascadero, Calif.: Ridgeview, 1993).

23. Strictly speaking, I am only sketching a way of beginning such an analysis, which would need to consider a wider class of thought experiments—for example, those of Spinoza, Berkeley, Hume—and clarify the precise logic of a thought experiment in general.

24. “What is at stake in the endeavor to ‘look awry’ at theoretical motifs is not just a kind of contrived attempt to ‘illustrate’ high theory, to make it ‘easily accessible,’ and thus to spare us the effort of effective thinking. The point is rather that such an exemplification, such a mise-en-scène of theoretical motifs renders visible aspects that would otherwise remain unnoticed” (Zizek, *Looking Awry*, p. 3).

25. The credits at the end of the film roll to the tune of Rage against the Machine’s “Wake Up,” and so the film ends, in a sense, with the same two words that *Total Recall* ended with.

26. Obviously many other films (as well as early modern thought experiments) could be taken up in this context. The recent film *Existenz* is one.

27. There is, however, one crucial scene that suggests another reading. In a hotel room on Mars, a man from Recall Incorporated tries to convince Quaid that he is still having a dream. Quaid points a gun at the man and is uncertain whether or not to believe him until he sees a single bead of sweat falling down the man’s face. That “stain” of the real—the palpable presence of the man’s fear—convinces Quaid that what he is experiencing is *not* a dream. He then kills the man. One could read this gesture as a kind of *passage à l’acte* (acting out) by which Quaid definitively renounces the fantasmatic character of his world.

28. But for an equally plausible reading of *The Matrix* as staging the Malebranchian doctrine, see Slavoj Žižek, “*The Matrix*, or Malebranche in Hollywood,” *Philosophy Today* 43, supplement (1999): 11–26.

29. Thus as a last-ditch effort to convince her “husband” that they really do have a sexual relationship, Quaid’s wife has this exchange with him: “If you don’t trust me, you can tie me up.” “I didn’t know you were so kinky.” “Maybe it’s time you found out.” In other words, she tries to reestablish the illusion of their sexual relationship by shifting fantasies.

30. In this respect, the politics of *13th Floor* are naively utopian. It is interesting, too, that the film “exorcises” that which prevents the married couple in *Total Recall* from being able to have a sexual relationship; it does this by having the woman’s “real” world husband (a double of Hall) get killed after violently trying to kill her. The situation here is exactly the inverse of that in *Total Recall*: there I suggested that it is as though Quaid fantasizes that his wife wants to kill him so that he can justify killing her to be with the sleazy and demure girl of his dreams; here, it is as though the woman fantasizes that her husband wants to kill her so that he can be killed—not to be with *another* partner but to be with an idealized version of him.

31. Lacan’s discussion of aphanisis occurs in *The Four Fundamental Concepts*, p. 207ff.

32. Slavoj Žizek, *The Metastases of Enjoyment: Six Essays on Woman and Causality* (New York: Verso, 1994), chapter 5.

33. As Jean-Claude Milner puts it, “precisely because the modern universe is defined by a boundless (mathematically infinite) relevance of the letter, the being that speaks and lives in the modern universe insistently asks that a limit be imposed on that infinite relevance.” See Jean-Claude Milner, “Lacan and the Ideal of Science,” in *Lacan and the Human Sciences*, ed. Alexandre Leupin (Lincoln: Nebraska University Press, 1991), p. 37.

34. Indeed, one might say that the politics of *Total Recall* and *The Matrix* are totally different for precisely this reason. In one we have the willfully ignorant “cynical” attitude, while in the other we have the stirrings of a youthful rebellion finally throwing off the yoke of years of political quietism. Indeed, *The Matrix* stages and condemns the cynicism of someone who does not care whether or not it is all just a dream, in the figure of the traitor—Cipher is his code name, but the AI man calls him “Mr. Reagan”—who agrees to betray the liberated humans in exchange for a hedonistic series of virtual pleasures inside the matrix. In *Total Recall*, trying to get his mind off Mars, Quaid’s wife says to him, “No wonder you’re having nightmares. You’re always watching the news.” This sort of reading could be pursued by considering the different political positions embodied in the writings of Descartes, Malebranche, Leibniz, and so on.

35. Lacan later modifies this idea, suggesting that the subject is a consequence of the fact that “there is counting.” See Lacan, *The Four Fundamental Concepts*, p. 20. I return to this point below.

36. Lacan, *The Four Fundamental Concepts*, p. 36.

37. Of course, if a signifier is a type rather than a token, further issues would need to be addressed, a point Derrida makes in slightly different terms in his “Signature Event Context,” in *Margins of Philosophy*, trans. Alan Bass (Chicago: University of Chicago Press, 1982).

38. Obviously something needs to be said here about the Kantian intervention, which seems to proscribe unintuitable mathematical truths. In the account I have presented, one might see Kant as a “reactionary” figure, and then see thinkers such as Bolzano and Frege as “revolutionaries” who again took up the Cartesian gauntlet, but I think that this picture would be something of an oversimplification. I will have something to say about Kant in what follows, but I will not address this particular topic.

39. Koyré, “Galileo and the Scientific Revolution,” p. 347.

40. One way of reading Lacan here would be to see him as reiterating the sort of thesis advanced by Eddington, according to which everyday objects such as tables do not “really” have any of the sensible properties that we ascribe to them, since it is the table as described by science—as a swarm of electrons, for example—that is truly real. Critics of this thesis have argued that if our scientific theories are about anything, they must be about the objects that we perceive, in which case Eddington’s concern is somewhat misplaced. Whether the same objection might be raised against Lacan is a question I cannot take up here, but I would suggest that the question turns on how the relationship between the being of beings and the truth of beings is conceived.

41. See especially Heidegger’s own discussion of Galileo in Martin Heidegger, *What Is a Thing?*, trans. W. B. Barton Jr. and Vera Deutsch (Chicago: Henry Regnery Company, 1967).

42. Žizek offers a similar reading in his *Tarrying with the Negative* (Durham: Duke University Press, 1993).

43. Again, I draw on the work of Žižek. See his *The Ticklish Subject: The Absent Centre of Political Ontology* (New York: Verso, 1999), p. 63.

44. Immanuel Kant, "Dreams of a Spirit-Seer Elucidated by Dreams of Metaphysics," in *Theoretical Philosophy, 1755–1770*, trans. and ed. David Walford (New York: Cambridge University Press, 1992), p. 357.

45. Andrew Cutrofello, *Imagining Otherwise: Metapsychology and the Analytic A Posteriori* (Evanston: Northwestern University Press, 1997).

46. Immanuel Kant, *Metaphysical Foundations of Natural Science*, in *Philosophy of Material Nature*, trans. James W. Ellington (Indianapolis: Hackett, 1985), p. 8.

47. Strictly speaking, the lines that knot theorists study are closed curves embedded in a containing space; the study of knots can in fact be thought of as the study of the spaces themselves. More precisely, if K is a knot embedded in the space S , knot theory would study the space that remains when K is eliminated from it, that is, one studies the space $S - K$. Kant would no doubt protest that, insofar as they imply spatiality, knots cannot provide us with a mathematical basis for a psychology of inner sense, whose temporal character precludes all spatial structure. Moreover, the linearity of time for Kant would imply that the time of inner sense does not close on itself—that is, my time line is not a closed curve but a sequence whose end points (my birth and my death) are distinct. Lacan's alternative understanding of time, particularly the retroactive character of symptom formation (his take on Freud's notion of *Nachträglichkeit*), lends itself to an alternative view here, though one whose details would need to be carefully spelled out. See Seminar I, the "Logical Time" essay, and a careful analysis of the latter in Bruce Fink, "Logical Time and the Precipitation of Subjectivity," in *Reading Seminars I and II: Lacan's Return to Freud*, ed. Bruce Fink, Richard Feldstein, and Maire Jaanus (Albany: State University of New York Press, 1995).

48. Kant's fullest discussion of this point occurs in the chapter on the "Discipline of Pure Reason" in the first *Critique*. See Immanuel Kant, *Critique of Pure Reason*, trans. Norman Kemp Smith (New York: St. Martin's Press, 1929).

49. Gottlob Frege, *The Foundations of Arithmetic: A Logico-Mathematical Enquiry into the Concept of Number*, trans. J. L. Austin (Evanston: Northwestern University Press, 1980), pp. 20–21; emphasis added.

50. Jacques-Alain Miller, "Suture (Elements of the Logic of the Signifier)," trans. Jacqueline Rose, in *Screen*, vol. XVIII, no. 4 (winter 1977/1978): 24–34.

51. Thus, citing Leibniz with approval, Frege notes that it is true to say, for instance, that the set consisting of "God, an angel, a man, and motion" is one containing exactly four members. See Frege, *The Foundations of Arithmetic*, p. 31. It also is worth noting that, according to Frege, it is a mistake to think that contradictory concepts do not exist. A contradictory concept is simply one with the empty set as its extension (p. 87). Frege's idea here suggests a way of clarifying my earlier discussion of Descartes. To say that God could have made it the case that $2 + 2 = 5$ is equivalent to saying that we can think the concept of $2 + 2$ equaling 5.

52. Although Lacan refers to the Borromean rings as a knot, they are typically classified by knot theorists as a link. A knot can be loosely defined as "a closed curve in space that does not intersect itself anywhere." See Colin C. Adams, *The Knot Book: An Elementary Introduction to the Mathematical Theory of Knots* (New York: W. H. Freeman and Company, 1994), p. 2. The simplest knot is a ring, often called the "trivial knot," or the "unknot." A link is generally defined as two or more knots intertwined in such a way that they cannot be separated without at least one of the knots being cut. "A link is a set

of knotted loops all tangled up together” (p. 17). Raymond Lickorish defines a link as a collection of closed curves, without stipulating that they be connected in any particular way. He then defines a knot as a link with only one component. See W. B. Raymond Lickorish, *An Introduction to Knot Theory* (New York: Springer-Verlag, 1997), p. 1. The Borromean link has the additional property that no two of its rings are linked: it is only in relation to the third that any two are inseparable. Knot theorists usually classify only a three-ring link of this sort as a Borromean link. Lacan treats the three-ring Borromean link as the simplest instance of a more general type, which would be an arbitrary number of rings linked in such a way that cutting one would release all. Arbitrary links that have this property are sometimes referred to by knot theorists as “Brunnian” rather than “Borromean.” See Adams, *The Knot Book*, p. 22.

53. The proximity between this thesis and Kant’s should be clear. The principal difference would be that transcendental philosophy assumes the existence of pure limits of reality separated from an inaccessible real, whereas psychoanalysis begins from the hypothesis that the real irrupts within reality.

54. It is noteworthy, moreover, that Kant never entirely reneges on this view. Even in his critical period, he continues to think (albeit, “problematically”) of physical space as generated by forces of repulsion and attraction that substances (including souls) exert on one another. These relations of force can be understood in geometrical terms. Kant goes so far as to suggest that we can know the law of gravity a priori.

55. See not only the essay in *Écrits*, but also Bruce Fink’s illuminating discussion in the second appendix to his *The Lacanian Subject: Between Language and Jouissance* (Princeton: Princeton University Press, 1995), pp. 165–72.